

Nos. 22-1972, -1973, -1975, -1976

IN THE
United States Court of Appeals
FOR THE FEDERAL CIRCUIT

MASIMO CORPORATION,

Appellant,

v.

APPLE INC.,

Appellee,

APPEAL FROM THE PATENT TRIAL AND APPEAL BOARD
CASE NOS. IPR2020-01713, IPR2020-01716, IPR2020-01733, IPR2020-01737

REPLY BRIEF OF APPELLANT MASIMO CORPORATION

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May 4, 2023

CERTIFICATE OF INTEREST

Counsel for Appellant Masimo Corporation certifies the following:

1. The full name of every party represented by me is:

Masimo Corporation.

2. The name of the real party-in-interest represented by me is:

Masimo Corporation.

3. All parent corporations and any publicly held companies that own more than 10 percent or more of the stock of the party represented by me are:

Blackrock Inc.

4. The name of all law firms and the partners or associates that appeared for the party in the lower tribunal or are expected to appear for the party in this court and who are not listed on the docket for the current case:

Knobbe, Martens, Olson & Bear, LLP: William R. Zimmerman and Jacob L. Peterson.

5. The case titles and numbers of any case known to be pending in this court or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal:

- *Masimo Corporation v. Apple Inc.*, U.S. Court of Appeals for the Federal Circuit, Case No. 22-1631 (consolidated with Case Nos. 22-1632, 22-1633, 22-1634, 22-1635, 22-1636, 22-1637, 22-1638)

- *Masimo Corporation v. Apple Inc.*, U.S. Court of Appeals for the Federal Circuit, Case No. 22-2069 (consolidated with Case Nos. 22-2070, 22-2071, 22-2072)
- *Masimo Corporation and Cercacor Laboratories, Inc. v. Apple Inc.*, U.S. District Court for the Central District of California, Case No. 8:20-cv-00048-JVS

6. Information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees):

Not applicable.

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: May 4, 2023

/s/ Stephen W. Larson
Stephen W. Larson

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TABLE OF CONTENTS

	Page No.
CERTIFICATE OF INTEREST	i
I. INTRODUCTION	1
II. ARGUMENT	1
A. Substantial Evidence Does Not Support The Board’s Finding In IPR1716/1733/1737 That Mendelson-2003 Would Have Motivated A POSITA To Add Detectors To Aizawa’s Four Detector Embodiment.....	4
B. Substantial Evidence Does Not Support The Board’s Finding In IPR1716/1733/1737 That Mendelson-2003 Would Have Motivated A POSITA To Add Detectors Farther From Aizawa’s Emitter.....	5
C. Substantial Evidence Does Not Support The Board’s Finding In IPR1716/1733/1737 That Mendelson-2003 Would Have Motivated A POSITA To Include Separate Sets Of Parallel-Connected Detectors In Aizawa’s Sensor	10
D. Substantial Evidence Does Not Support The Board’s Finding In IPR1713/1716/1733/1737 That Ohsaki Would Have Motivated A POSITA To Add A Convex Protrusion To Aizawa’s Sensor.....	15
1. Ohsaki Would Not Have Motivated A POSITA To Add A Convex Cover To Aizawa’s Sensor To Improve Detection Efficiency.....	15
2. Ohsaki Would Not Have Motivated A POSITA To Add A Convex Cover To Aizawa’s Sensor To Improve Adhesion.....	21

TABLE OF CONTENTS
(*cont'd*)

	Page No.
3. Ohsaki Would Not Have Motivated A POSITA To Add A Convex Protrusion To Aizawa's Sensor To Provide Protection.....	24
E. Substantial Evidence Does Not Support The Board's Finding In IPR1713/1716/1733 That Particular Protrusion Heights Would Have Been Obvious	25
III. CONCLUSION.....	27
CERTIFICATE OF COMPLIANCE.....	28

TABLE OF AUTHORITIES

Page No(s).

<i>Apple Inc. v. Masimo Corp.</i> , No. IPR2020-01520, 2022 WL 557896 (P.T.A.B. Feb. 23, 2022).....	20
<i>Brand v. Miller</i> , 487 F.3d 862 (Fed. Cir. 2007)	24
<i>Brown & Williamson Tobacco Corp. v. Philip Morris Inc.</i> , 229 F.3d 1120 (Fed. Cir. 2000)	15
<i>Chemours Co. v. Daikin Indus.</i> , 4 F.4th 1370 (Fed. Cir. 2021)	1, 5
<i>DSS Tech. Mgmt., Inc. v. Apple Inc.</i> , 885 F.3d 1367 (Fed. Cir. 2018)	1
<i>In re Fine</i> , 837 F.2d 1071 (Fed. Cir. 1988)	5, 22
<i>In re Fulton</i> , 391 F.3d 1195 (Fed. Cir. 2004)	4
<i>Gen. Elec. Co. v. Raytheon Techs. Corp.</i> , 983 F.3d 1334 (Fed. Cir. 2020)	13
<i>Novo Nordisk A/S v. Caraco Pharm. Labs., Ltd.</i> , 719 F.3d 1346 (Fed. Cir. 2013)	5, 22
<i>PAR Pharm., Inc. v. TWI Pharms., Inc.</i> , 773 F.3d 1186 (Fed. Cir. 2014)	13
<i>Polaris Indus. v. Arctic Cat, Inc.</i> , 882 F.3d 1056 (Fed. Cir. 2018)	5
<i>TQ Delta, LLC v. Cisco Sys., Inc.</i> , 942 F.3d 1352 (Fed. Cir. 2019)	1

TABLE OF AUTHORITIES
(cont'd)

Page No(s).

<i>Uber Technologies, Inc. v. X One, Inc.</i> , 957 F.3d 1334 (Fed. Cir. 2020)	27
<i>In re Warsaw Orthopedic, Inc.</i> 832 F.3d 1327 (Fed. Cir. 2016)	26

OTHER AUTHORITIES

Federal Rule of Appellate Procedure 32	28
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I. INTRODUCTION

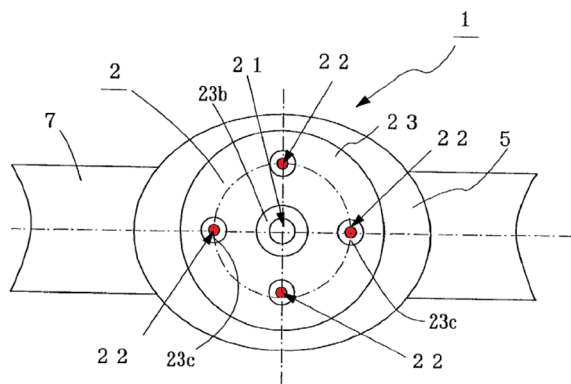
Apple repeatedly invokes the substantial evidence standard, but does so to obscure the Board's numerous mistakes. This Court does not hesitate to reverse or remand where, as here, the Board makes findings that are unsupported or the result of error. *See, e.g., Chemours Co. v. Daikin Indus.*, 4 F.4th 1370, 1376 (Fed. Cir. 2021); *TQ Delta, LLC v. Cisco Sys., Inc.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019); *DSS Tech. Mgmt., Inc. v. Apple Inc.*, 885 F.3d 1367, 1377 (Fed. Cir. 2018).

II. ARGUMENT

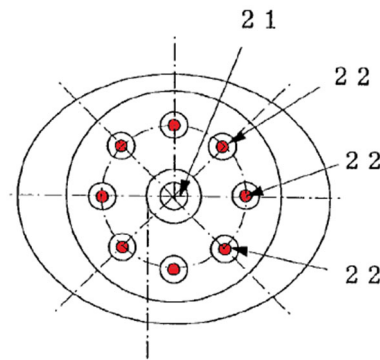
Apple does not squarely address the Board's errors. The Board attempted to recreate the claims through a series of complicated, arbitrary, and unjustifiable modifications of the prior art, any one of which justifies reversal.

First, the Board determined that a POSITA would rely on Aizawa to create an eight-detector sensor. Appx00107-00108; Appx00188-00189; Appx00264-00265. However, according to Apple¹, the Board reasoned a POSITA would ignore Aizawa's *existing* eight-detector sensor (below right) and instead modify Aizawa's four-detector sensor (below left). Resp. 21.

¹ The Board was not clear as to whether it started with Aizawa's four-detector or eight-detector embodiment. Apple argues the Board started with Aizawa's four-detector embodiment. Resp. 24. Masimo's opening brief argued that the Board started with Aizawa's eight-detector embodiment. Br. 26. For the purpose of responding, Masimo assumes in this reply that the Board started with Aizawa's four-detector embodiment.

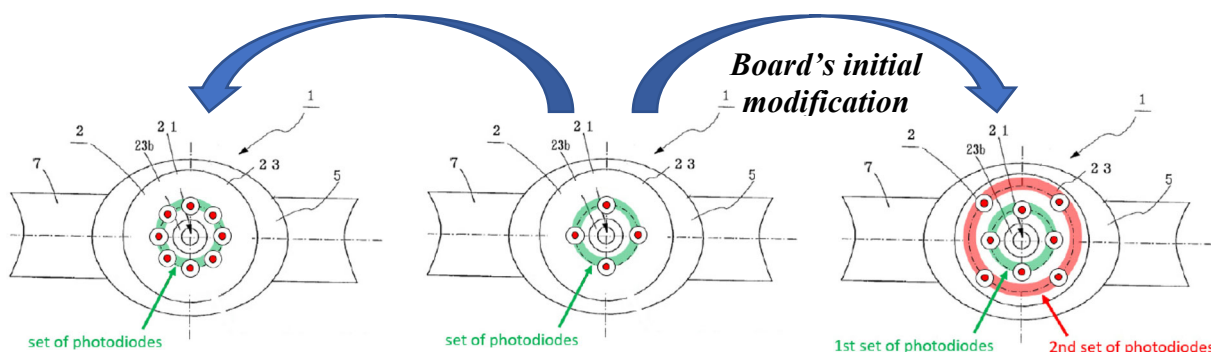


Aizawa Four Detector Sensor
Fig. 1A
 (color added, Appx02489)²



Aizawa Eight Detector Sensor
Fig. 4A
 (color added, Appx02491)

Second, rather than add detectors to Aizawa's existing detector ring (*e.g.*, as shown below left), as taught by Aizawa's existing eight-detector sensor, the Board decided a POSITA would place the four additional detectors into a second farther ring (below right). Appx00107-00108; Appx00188-00189; Appx00264-00265.



Eight-Detector Single-Ring Sensor

Four-Detector Single-Ring Sensor

Board's Aizawa-Mendelson-2003 Combination³

² Masimo provides representative citations to exhibits in view of common exhibits across IPRs unless otherwise noted.

³ See Appx00100; Appx000181; Appx00257.

The Board relied on increased signal strength and improved power consumption as a motivation for the new far ring of detectors. Appx00107-00108; Appx00188-00189; Appx00264-00265. But Aizawa's *single-ring* eight-detector sensor produces a substantially better signal strength than the Board's dual-ring arrangement, which places four of the detectors *farther away* from Aizawa's centrally located emitter. Br. 27-30; Resp. 23-25.

Third, the Board found a POSITA would reconfigure (1) the near ring of detectors into a first parallel-connected circuit and (2) separately connect the second far ring of detectors into a second parallel-connected circuit, ostensibly based on teachings in Mendelson-2003. Appx00108-00109; Appx00189-00190; Appx00265-00266. But Mendelson-2003's parallel connections were merely an experimental setup for laboratory measurements. Appx10230. There is no indication Mendelson-2003's experimental setup was ever contemplated for use in a monitoring physiological sensor. Instead, Mendelson-2003 clearly teaches that when making a physiological sensor, a POSITA should connect *all* detectors in parallel and produce a single signal stream. Appx10232.

Fourth, the Board modified Aizawa's flat cover into a convex cover based on Ohsaki. Appx00035; Appx00129; Appx00208; Appx00285-00286. The Board found that a POSITA would have been motivated to add a convex surface to improve detection efficiency, improve adhesion, and provide protection. *Id.* But Aizawa

already teaches that its *flat* cover provides improved detection efficiency, improved adhesion, and protection. Appx02492 ¶[0013]; Appx02489 Fig. 1B. Moreover, Ohsaki teaches a convex surface slips at Aizawa’s measurement site on the wrist’s palm-side. Appx02546 ¶[0023].

Substantial evidence does not support the Board’s complex recreation of Masimo’s claims. It would not have been desirable, let alone obvious, to make the Board’s many changes to the prior art to arrive at Masimo’s invention.

A. Substantial Evidence Does Not Support The Board’s Finding In IPR1716/1733/1737 That Mendelson-2003 Would Have Motivated A POSITA To Add Detectors To Aizawa’s Four Detector Embodiment

The Board first found that a POSITA would add detectors to Aizawa’s four-detector embodiment even though Aizawa already discloses an eight-detector embodiment. Appx00107-00108; Appx00188-00189; Appx00264-00265. Apple cites *Fulton* to argue “it is sufficient for obviousness that the proposed combination improves on Aizawa’s four-detector embodiment.” Resp. 25 (citing *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004)). But *Fulton* explains that “the prior art as a whole must ‘suggest the desirability’ of the combination.” *Fulton*, 391 F.3d at 1200. Here, Aizawa discloses both four and eight-detector embodiments that use the same single-ring sensor design. Appx02489; Appx02491. Mendelson-2003 does not suggest the desirability of modifying Aizawa in a way that deviates from Aizawa’s eight-detector embodiment. Br. 26-28.

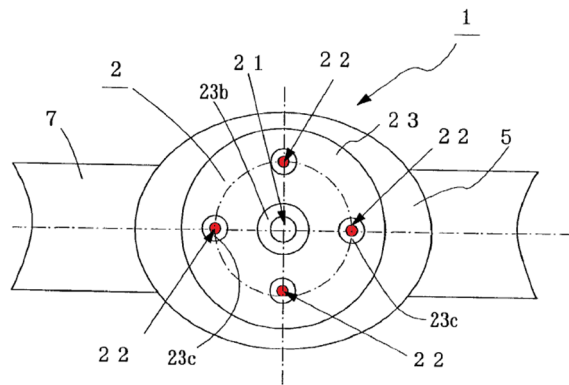
The Board erred by focusing on just a small part of Aizawa and ignoring the remainder. “One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.” *In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988); *see also Novo Nordisk A/S v. Caraco Pharm. Labs., Ltd.*, 719 F.3d 1346, 1365 (Fed. Cir. 2013) (same); *Chemours Co. v. Daikin Indus.*, 4 F.4th 1370, 1376 (Fed. Cir. 2021) (reversing where Board did not “adequately grapple” with why POSITA would have made modification given prior art’s express disclosure); *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 (Fed. Cir. 2018) (“a reference ‘must [be] considered for all it taught, [including] disclosures that diverged and taught away from the invention at hand”).

Apple parrots the Board’s analysis. Resp. 21-23. But Apple never explains why a POSITA designing an eight-detector sensor would have ignored Aizawa’s single-ring eight-detector design and instead modified Aizawa’s single-ring four-detector design.

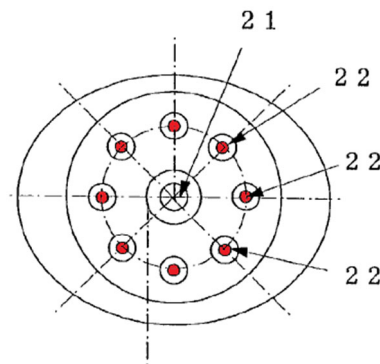
B. Substantial Evidence Does Not Support The Board’s Finding In IPR1716/1733/1737 That Mendelson-2003 Would Have Motivated A POSITA To Add Detectors Farther From Aizawa’s Emitter

The Board next found that a POSITA would add detectors to Aizawa’s sensor *farther* from Aizawa’s emitter, instead of positioning all detectors in one concentric ring as expressly taught by Aizawa’s existing eight-ring embodiment. Appx00107-00108; Appx00188-00189; Appx00264-00265.

Apple argues that adding a far ring of detectors would improve signal strength and power consumption. Resp. 21-22. But Aizawa explains that adding detectors to its *existing* single-ring design “improve[s] detection efficiency.” Appx02493 ¶[0032]. Aizawa illustrates its single-ring four-detector and eight-detector sensors in Figures 1A and 4A shown below.



Aizawa Fig. 1A
(color added, Appx02489)



Aizawa Fig. 4A
(color added, Appx02491)

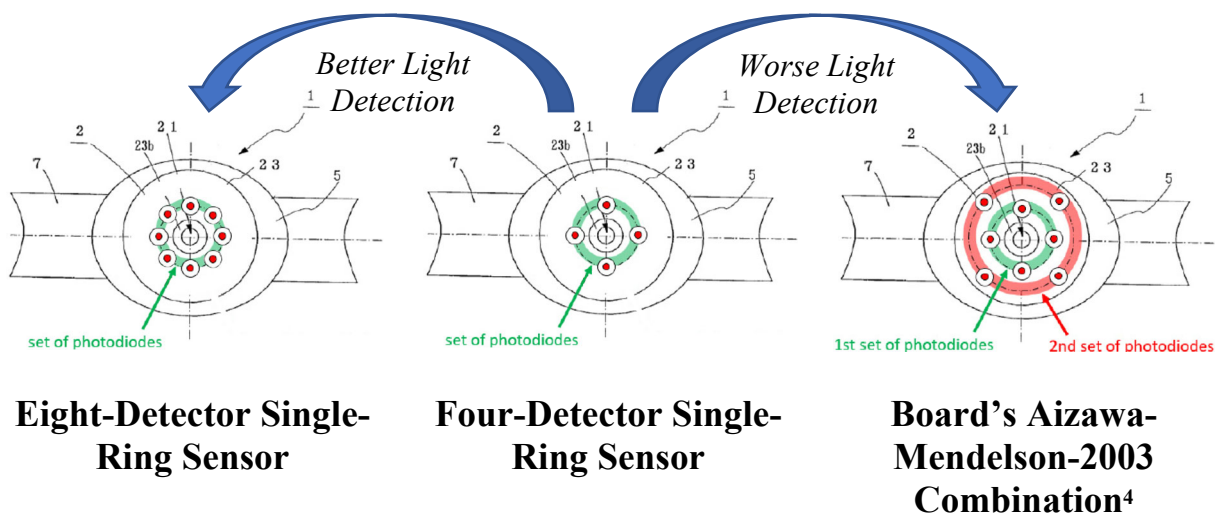
Aizawa teaches its eight-detector sensor (above right) improves on the detection efficiency of its four-detector sensor (above left), positioning all detectors in *one* concentric ring. Appx02493 ¶[0032].

Apple argues the Board’s combination placing additional detectors farther from Aizawa’s existing ring “increases both signal amplitude and battery life.” Resp. 23. But there was no dispute that detected signal decreases rapidly when detectors are positioned farther from the emitter. *See* Appx10232 (Mendelson-2003: “the backscattered light intensity measured is inversely related to the separation distance between the PD and the LEDs”). Apple’s expert agreed the intensity of

reflected light signal decreases exponentially with increased distance from the emitter. *See* Appx08531 ¶96 (reflected-light intensity decreases in proportion to square of distance); Appx14298-14299 100:6-101:6 (“I think we know from the discussion we’ve already had today, that there’s more signal available in the region close to the center versus out at the end.”). A ring of detectors farther from the emitter “was expected” to have reduced signal strength and worse power consumption. Br. 28.

The Board thus illogically found that a POSITA motivated to increase signal strength would be motivated to create a sensor that decreases signal strength compared to Aizawa’s *already disclosed* eight-detector embodiment. *Id.* 26. The figures below illustrate that adding detectors to the inner ring—consistent with Aizawa’s disclosure—provides better light collection than the Board’s combination.

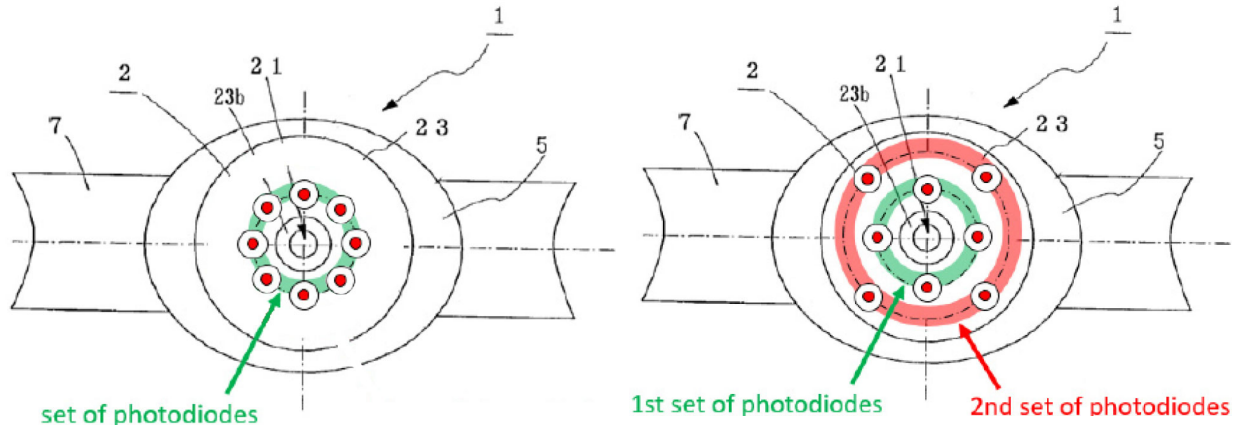
Aizawa’s Disclosed Modification versus Board’s Modification of Aizawa



⁴ See Appx00100; Appx000181; Appx00257.

Moreover, substantial evidence does not support the Board's finding that Mendelson-2003 "plainly suggests" adding a *separate far* detector ring in Aizawa's single-ring design "would result in a power savings over a single ring." Br. 27-28. Aizawa's existing eight-detector embodiment with its single detector ring would provide superior signal strength and thus require less power consumption compared to the Board's dual-ring design. *Id.*

Indeed, Apple's expert confirmed that if the goal was "to produce the same likely waveform and do that with a reduction in the power from the LEDs, and you had room to put detectors into the system, I think we know from the discussion we've already had today, that there's more signal available in the region close to the center versus out at the end." Appx14298-14299 100:6-101:6. As illustrated below, there was "room to put detectors" into the Board's inner ring (below left) to capture a stronger signal. The Board nonetheless illogically placed detectors farther from the combination's centrally located emitter (below right). Appx00107-00108; Appx00188-00189; Appx00264-00265.



**Eight-Detector Sensor with
Detectors Positioned Equally
Close to Emitter**

**Board's Dual-Ring Aizawa-
Mendelson-2003 Combination⁵**

Apple argues that Masimo “mischaracterize[es] the combination Apple proposed and the Board adopted as involving ‘moving’ Aizawa’s detectors away from the center.” Resp. 24. But by adding four detectors to Aizawa’s four-detector arrangement and placing them farther away from the emitter, the Board’s modification effectively results in an eight-detector arrangement with four detectors farther away from the emitter when compared to Aizawa’s existing eight-detector arrangement. A POSITA motivated by the desire for increased signal strength and improved power consumption would not have modified Aizawa’s single-ring design into the Board’s dual-ring design. Only hindsight reconstruction would lead to the Board’s combination.

⁵ See Appx00100; Appx000181; Appx00257.

Apple also raises a new argument on appeal—that an artisan could start with any Aizawa embodiment and keep adding detectors in any location *ad infinitum*. Resp. 24. That was not what Apple proposed in its petitions, nor what the Board found in its decisions. *See, e.g.*, Appx00100 (Board’s decision illustrating eight-detector sensor); Appx06895-06896, Appx06904-06905 (Apple’s petition illustrating eight-detector sensor); Appx08528, Appx08536 (Apple’s expert declaration illustrating eight-detector sensor). Mendelson-2003 indicates that detectors positioned farther from an emitter receive a weaker optical signal and thus require much higher drive currents and relatively higher power consumption. Br. 28. Apple nowhere explains why a POSITA would have continued to add detectors to Aizawa’s sensor beyond the Board’s eight-detector combination.

Accordingly, substantial evidence does not support the Board’s second modification incorporating a new far ring of detectors in Aizawa’s sensor.

C. Substantial Evidence Does Not Support The Board’s Finding In IPR1716/1733/1737 That Mendelson-2003 Would Have Motivated A POSITA To Include Separate Sets Of Parallel-Connected Detectors In Aizawa’s Sensor

The Board next found that a POSITA would reconfigure Aizawa’s detectors with parallel connections that provide multiple separate signal streams. Appx00108-00109; Appx00189-00190; Appx00265-00266. This is a fundamental change to Aizawa, which the Board found is not even “capable” of monitoring multiple signal

streams (e.g., from individual detectors). Appx00111-00112; Appx00193; Appx00268-00269.

The Board looked to Mendelson-2003 to support its dramatic modification of Aizawa. Appx00108-00109; Appx00189-00190; Appx00265-00266. But Mendelson-2003 recognized that in a functioning physiological monitor, like Aizawa's sensor, *all* detectors should be connected in parallel and produce one signal stream. Appx10232.

Rather than adopt Mendelson-2003's teaching about constructing physiological monitors, the Board relied on features in Mendelson-2003's laboratory testing system used for *experiments*. Br. 34-35. Specifically, Mendelson-2003 used multiple signal streams to determine just how much a light signal decreases when detecting with a near detector arrangement or a far detector arrangement. Appx10230. Substantial evidence does not explain why a POSITA would use such an experimental arrangement in a functioning physiological sensor like Aizawa's. Br. 34-35. Indeed, the Board identified various alleged benefits, including "monitoring for displacement, accounting for motion artifacts, and compensating for the relative decrease in light that reaches the outer ring," but none were due to *parallel*-connected detector sets providing different signal streams and instead resulted from monitoring *individual* detectors. Br. 30-32.

Apple argues that “[h]ow Aizawa’s detectors are connected is immaterial,” and that “Mendelson-2003’s disclosure alone is dispositive because obviousness does not require showing a motivation to retain claim elements ‘already present together in a reference.’” Resp. 28. But the Board did not merely retain claim elements present in Mendelson-2003. The Board (1) undertook a reconfiguration of Aizawa’s sensor that substantially reduced detected signal strength, (2) modified Aizawa’s electrical connections in a way that produced multiple signal streams, which the Board previously found Aizawa was not “capable” of monitoring, and (3) failed to point to any teaching of how a POSITA would use the multiple signal streams in a physiological measurement device, as opposed to Mendelson-2003’s laboratory setup. Br. 28, 30-31, 34-35.

In contrast, Masimo’s patents explain in detail the unexpected advantage of using parallel connections and multiple separate signal streams. Masimo explains that an algorithm was developed to use detectors at different path lengths and multiple signal streams to improve physiological measurements. Appx00405-00406 34:63-35:34; Appx00393 9:19-22, 9:30-33; Br. 10-13. A signal processor can analyze the signal streams from different detector sets, increasing signal diversity and facilitating measurements that are robust. Br. 11-12. Masimo’s patents explain that when there is a sufficient difference in mean path length between the detectors, connecting the detectors in parallel leads to signal averaging and noise cancellation

and reduction. *Id.* 12. None of Masimo’s innovations are related to, much less suggested by, the Board’s simplistic and conclusory motivations. *Id.* 10-13.

Apple cites *Gen. Elec. Co. v. Raytheon Techs. Corp.*, 983 F.3d 1334, 1352 (Fed. Cir. 2020), Resp. 28, but that case emphasized that a patent challenger cannot “merely show[] that all elements of the claim exist, without showing why an artisan might combine the elements.” *Gen. Elec.*, 983 F.3d at 1351-52. Mendelson-2003 does not suggest constructing two separately connected detector rings in physiological sensor for patient monitoring. Br. 34-35. To the contrary, as discussed, Mendelson-2003 teaches that for physiological monitoring, such a sensor should connect **all** detectors in parallel and produce **one** signal stream. Appx10232.

Apple admits that neither Aizawa nor Mendelson-2003 “discuss the benefits of separate parallel connections.” Resp. 28-29. Apple instead argues the Board could find a motivation merely based on its expert’s testimony. *Id.* (citing *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197 (Fed. Cir. 2014)). Apple cites *PAR*, but *PAR* requires specific motivations supported by record evidence. *See PAR*, 773 F.3d at 1197. Apple cites to its expert’s reliance on Mendelson-799 (Appx10233-10248) as purportedly achieving benefits, including monitoring displacement or motion, “by maintaining separate streams coming from each of its inner and outer rings of photodetectors.” *See, e.g.*, Resp. 28 (citing Appx08530-08531 ¶¶95). But Apple’s expert admitted Mendelson-799 achieves its benefits by

monitoring *individual* detectors, not by monitoring separate streams from a near and far ring of photodetectors. Br. 31-32.

Apple now concedes that Mendelson-799's benefits come from photodetectors "measured individually rather than being wired in parallel." Resp. 29. Apple nevertheless argues that its expert's speculative and unsupported deposition testimony can provide substantial evidence for the Board's findings. *Id.* 28-29. But Apple's expert's off-the-cuff speculation that he thought "there would be a similar benefit if you gained up the rings separately and processed the ratio" finds no evidentiary support in the record. *Id.* 29-30 (*citing* Appx14316 118:2-15; Appx14317-14318 119:6-120:3). To the contrary, as discussed, Mendelson-799 teaches its benefits come from comparing individual detector signals from individual detector pairs. Br. 31-32; *see* Appx10246-10247 12:37-13:7 (obtaining benefit from "selectively disregard[ing]" individual photodiode readings); *see also* Appx10246 12:39-44 (Mendelson-799 warning against "summing the individual intensities of each photodetector and using the resulting value" because it "can introduce large errors"). Combining the individual detectors signals in each ring through a parallel connection would thus eliminate the benefits identified by Mendelson-799.

Apple asserts that multiple signal streams also provide the benefit of "adjusting for the amount of light that reaches the outer ring." Resp. 30-31. But adjusting for the reduced light at the outer ring is only pertinent because the Board

placed detectors farther from the combination's emitter in the first place. Br. 32-33. Nothing supports that a POSITA would (1) create a flawed combination with a weaker and noisier signal and then (2) employ multiple signal streams to amplify the weaker and noisier signal. *Id.* Indeed, amplifying the signal from the outer ring would amplify the signal's noise. *Id.*

Apple cites *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1125 (Fed. Cir. 2000)), Resp. 31, but *Brown & Williamson* warns a showing of a motivation to combine “must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not ‘evidence.’” *Brown & Williamson*, 229 F.3d at 1125. The Board disregarded *Brown & Williamson*'s guidance to arrive at Masimo's claims.

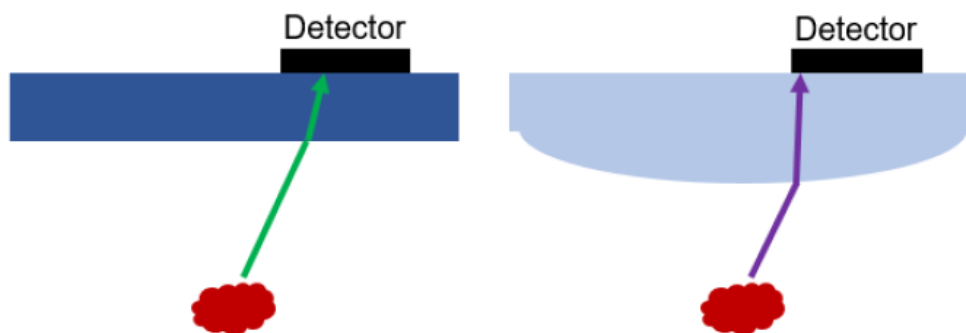
D. Substantial Evidence Does Not Support The Board's Finding In IPR1713/1716/1733/1737 That Ohsaki Would Have Motivated A POSITA To Add A Convex Protrusion To Aizawa's Sensor

The Board next modified Aizawa's flat cover into a convex cover based on Ohsaki. Appx00035; Appx00129; Appx00208; Appx00285-00286. The Board's modification is erroneous for many reasons.

1. Ohsaki Would Not Have Motivated A POSITA To Add A Convex Cover To Aizawa's Sensor To Improve Detection Efficiency

Apple argues the Board properly found that Ohsaki would have motivated a POSITA to incorporate a convex surface on Aizawa's sensor to improve detection efficiency. Resp. 35-38. But Apple and its expert admitted that: (1) with a convex

surface, “the incoming light is ‘condensed’ toward the center,” (2) the combination’s convex surface would result in “more light in the center than at the outer edge,” and (3) “that’s because light’s being directed towards the center and away from the edge....” Br. 37-38. Apple’s expert illustrated that a convex cover (below right) directs light more centrally compared to a flat cover (below left):



Apple’s Illustrations of Light-Redirection (Appx06526)

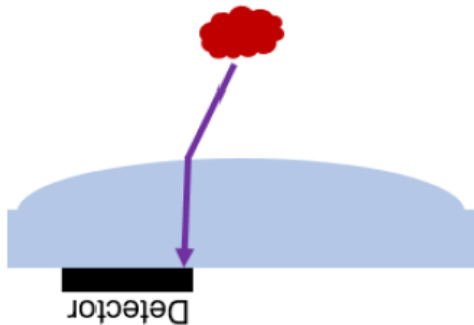
Apple’s expert explained that the above-right illustration shows “the incoming light is ‘condensed’ toward the center.” Appx06525-06526 ¶119. Masimo explained, consistent with Apple’s admissions, that a POSITA would have understood that adding a convex cover to Aizawa’s sensor would reduce signal strength detected by Aizawa’s peripherally located detectors. Br. 39.

Apple argues that “the Board properly rejected Masimo’s arguments that a convex cover would condense light toward the center of Aizawa’s sensor.” Resp. 38. But Apple has repeatedly *admitted* that a convex lens condenses light toward the center, even in related appeals before this Court. *See e.g.*, D.I. 19 (Response) at

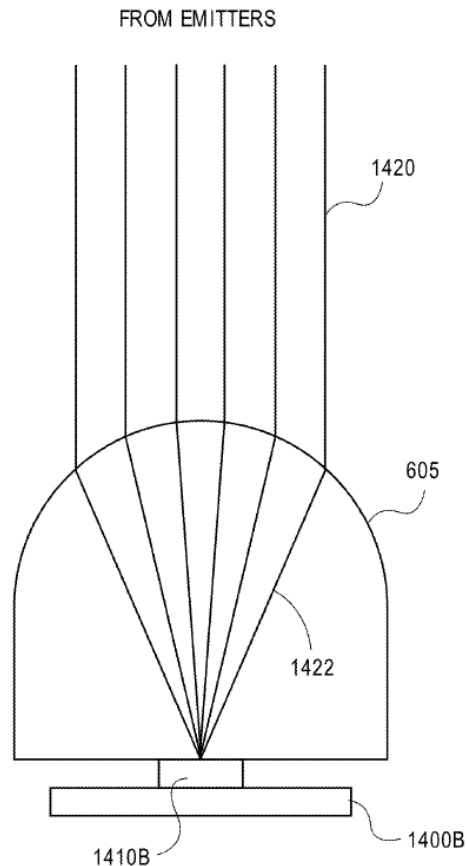
29, Appeal No. 22-2069 (consol.) (Fed. Cir.) (Apple admitting that “a convex lens would generally cause incoming light to condense toward the center.”). Apple’s numerous admissions demonstrate that all of the Board’s combinations placing a convex surface over peripheral detectors are erroneous. Br. 39. Apple cites the Board’s observation that “Masimo’s expert testimony focused on only the behavior of collimated and perpendicular light.” Resp. 38. The Board’s observation was demonstrably incorrect. Masimo’s expert expressly described the impact of a convex surface on diffused light, as well as collimated or perpendicular light. Br. 43-45. Apple even acknowledges that Masimo’s expert testified that “a POSA, viewing Figure 14B in the context of the specification, would understand that it represents light from the measurement site that could include all kinds of light, *including collimated and diffused light.*” Resp. 39 (emphasis added).

Apple next argues that the Board appropriately limited Figure 14B in Masimo’s patents solely to the illustrated light rays and “collimated light.” Resp. 40. But Figure 14B broadly describes light “attenuated by body tissue” and generally describes the refractive effect of the convex shape. *See, e.g.*, Appx00406 36:13-32; Br. 43-45. There is no dispute that light attenuated by the body tissue is no longer collimated. *See, e.g.*, Resp. 37 (Apple endorsing Board’s finding that light passing through tissue scatters and diffuses).

Masimo's Figure 14B (below right) and Apple's figure (below left) *both* illustrate a convex surface condensing incoming light toward the center. Br. 37-38, 43-45. Apple's expert admitted the condensing function of a convex surface compared to a flat surface is a general phenomenon. Appx06525-06526 ¶119.



Apple's Illustration of Light-Redirection (rotated, Appx06526)



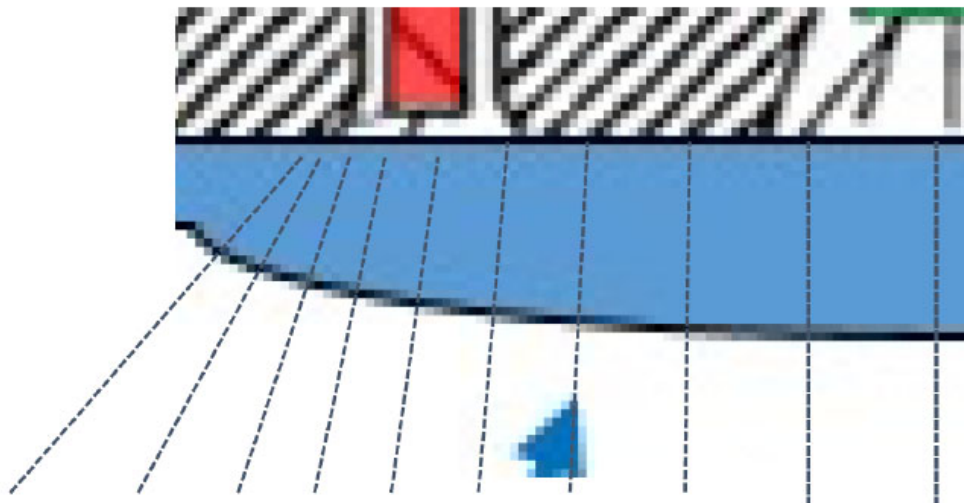
Masimo's Fig. 14B (Appx00359)

Apple next argues the Board's "additional light capture" analysis was not a new theory and instead merely expanded on "an already-disclosed theory." Resp. 35. But Apple is incorrect. Apple's petitions and expert declarations repeatedly contended that a convex surface would direct light centrally. Br. 37-38. After

Masimo confronted Apple with the fundamental flaw in all of its combinations, Apple changed positions, disregarded its numerous prior admissions, and asserted new theories inconsistent with the previous positions. *Id.* 40-42. Indeed, Apple points to the same arguments (Appx01233-01237) that Masimo already explained include no mention of capturing more overall light. Resp. 35-36; Br. 41-42.

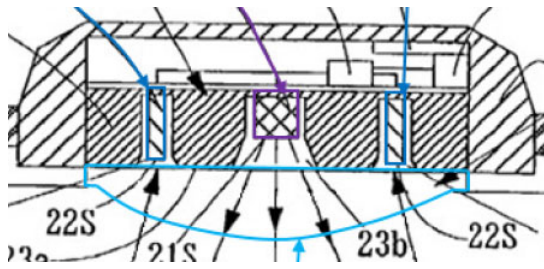
Apple argues that issues raised “in this appeal do not materially differ from those” raised in the appeal from, *e.g.*, IPR2020-01520. Resp. 31 (*citing* Appeal No. 22-1631 (consol.)). But Apple’s and the Board’s inconsistent positions highlight the Board’s hindsight-driven approach. For example, before this Court, Apple previously defended the precision accorded its petition figures by the Board in IPR2020-01520. *See* D.I. 27 (Response) at 42-43 Appeal No. 22-1631 (consol.) (Fed. Cir.) (Apple arguing that the combination’s “lens’s curvature is most pronounced at the edges of the lens near the peripheral detectors” to “increase the amount of incoming light directed” to the peripheral detectors.). Apple now suggests those same petition figures “were merely illustrative, not intended to describe a specific convex surface with mathematical precision.” Resp. 43-44. Apple cannot (1) embrace the Board’s analysis in Appeal No. 22-1631 (consol.) as supporting the Board’s obviousness findings in that proceeding and (2) brush off that same analysis in this appeal when the analysis fails to support Apple’s arguments.

Indeed, the Board in IPR2020-01520 relied on Apple’s expert’s analysis of an illustration of the combination that adds orthogonal lines (below) as alleged evidence of increased light collection for a specific shape. *See Apple Inc. v. Masimo Corp.*, No. IPR2020-01520, 2022 WL 557896, at *21 (P.T.A.B. Feb. 23, 2022).

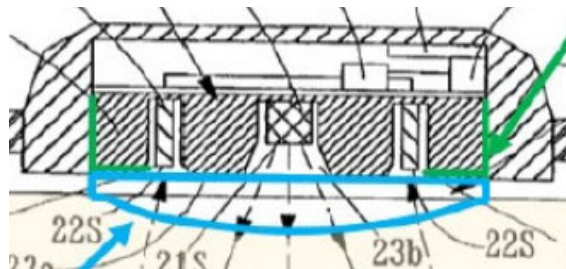


The Board’s reasoning in that proceeding stressed the “rapidness” of the change in the curvature “near the edge” of the convex surface in finding “an improvement in the light concentration at the location of the detectors.” *Id.*

The Board’s reasoning cannot apply here. As shown below, Apple’s figures in, for example, IPR1713 do not demonstrate a consistent “rapidness” of change near the detectors.



**Apple's Convex Shape in Petition
in IPR1713 (Appx01237)**



**Apple's Convex Shape in Reply
in IPR1713 (Appx01605)**

Apple's large convex surface (above left) incorporates a very different "rapidity" in the change of curvature from Apple's small convex surface (above right). The Board's decisions here make no mention of the "rapidity" in the change of curvature "near the edge" of the combination's convex surface. The Board's combinations were driven by hindsight, not a predictable analysis of the prior art.

2. Ohsaki Would Not Have Motivated A POSITA To Add A Convex Cover To Aizawa's Sensor To Improve Adhesion

The Board also found that Ohsaki would have motivated a POSITA to incorporate a convex surface on Aizawa's sensor to improve adhesion. Appx00035; Appx00129; Appx00208; Appx00285-00286. But Aizawa states that its sensor's flat surface already provides "improve[d] adhesion." Appx02492 ¶[0013]. Apple identifies no evidence suggesting Aizawa's flat-surface design faced adhesion problems or required further improved adhesion.

Aizawa expressly discloses that its flat surface provides "improved adhesion" on the wrist's palm-side. *Id.*; Appx02490 Fig. 2. In contrast, Ohsaki explains that its convex surface has a "tendency to slip off" on the wrist's palm-side. Appx02546

¶[0026]. Apple provides no evidence that a convex surface that slips on the wrist's palm-side would improve adhesion on Aizawa's palm-side sensor. If anything, adding a convex cover to Aizawa's sensor, as proposed by the Board, would diminish Aizawa's "improved adhesion" and cause Aizawa's sensor to slip. Br. 49-50. The Board erred by failing to reconcile the disclosures as a whole. *See In re Fine*, 837 F.2d at 1075 ("One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."); *Novo Nordisk A/S*, 719 F.3d at 1365 (same).

Apple claims "the Board properly rejected Masimo's argument that Apple should be limited to the location of Aizawa's sensor (on the wrist's palm side) because Apple's combination does not propose bodily incorporation of Ohsaki's protrusion into Aizawa's device." Resp. 33. But the Board did not account for the specific and different positioning required by the sensors in Aizawa and Ohsaki. Br. 49-50, 53. Aizawa discloses a sensor that monitors a signal from an artery and therefore must be positioned close to the wrist's arteries on the wrist's palm-side. *Id.* 46-47, 53. Apple does not dispute that there are no arteries on the wrist's backside from which Aizawa's sensor could monitor an arterial signal. Resp. 8-10. Ohsaki, in contrast, repeatedly indicates its teachings apply only to the wrist's backside and a convex surface only prevents slipping on the wrist's backside. Appx02542 Abstract; Appx02546 ¶¶[0023]-[0024]; Appx02544 Figs. 3A-3B.

Apple argues that the Board “properly exercised its fact-finding role to find that ‘Ohsaki discloses that, in at least some circumstances, a convex surface located on the front of the user’s wrist achieves benefits.’” Resp. 34. But the Board’s “circumstances” were when “the user is at rest.” *Id.* In contrast, the Board’s motivation for adding the convex cover to Aizawa’s sensor was improved adhesion during user movement. Appx00036 (“apply a cover with a convex surface to Aizawa” in order “to resist movement of the sensor”); Appx00129-00130; Appx00209-00210; Appx00286-00287. Apple’s arguments acknowledge that improved adhesion during movement—not at rest—was the motivation for combining Ohsaki with Aizawa. *See* Resp. 32-33 (Apple’s expert’s opinion that a POSITA “would have understood that a protruding convex cover would ***reduce the adverse effects of user movement*** on signals obtainable by photodetectors which are positioned to detect light reflected from user tissue”) (emphasis added). That Ohsaki’s convex surface could transmit light when the user is still does not provide substantial evidence support for the Board’s motivation of improving adhesion while the user is in ***motion***. Br. 53.

The Board also based its analysis on its own new and unsupported theory that Aizawa’s improved adhesion stems from the material used, not the flat shape. Appx00044; Appx00137; Appx00216-00217; Appx00294. Apple argues that the Board “did not develop its own theory,” but Apple identifies nowhere in the record

that Apple or Masimo—or either party’s experts—ever asserted that Aizawa’s plate improves adhesion because of its acrylic material. Resp. 34. “[I]n the context of a contested case, it is impermissible for the Board to base its factual findings on its expertise, rather than on evidence in the record.” *Brand v. Miller*, 487 F.3d 862, 869 (Fed. Cir. 2007).

3. Ohsaki Would Not Have Motivated A POSITA To Add A Convex Protrusion To Aizawa’s Sensor To Provide Protection

The Board also found a POSITA would have added a convex cover to Aizawa’s sensor for protection. Appx00035; Appx00129; Appx00208; Appx00285-00286. Apple argues that adding a convex cover to Aizawa’s sensor is “simply a case of substituting one known’ structure for protecting sensor elements ‘for another’ which ‘could be interchangeably used.’” Resp. 46. That a POSITA could add a convex cover does not show that a POSITA would have been motivated to do so, particularly given the resulting flawed optics and reduced adhesion discussed above. *See* Sections II.D.1-2.

Indeed, Apple, like the Board, fails to explain why Aizawa’s sensor needed any protection at all with a convex cover given Aizawa’s existing flat plate. Resp. 46. As discussed above, a POSITA would have understood that a convex cover would reduce signal strength and cause slipping of Aizawa’s sensor at the measurement site. *See* Sections II.D.1-2. Aizawa’s sensor already includes a flat

cover that provides protection without those fundamental flaws. Appx02490 Fig. 2; Appx02492 ¶[0013].

E. Substantial Evidence Does Not Support The Board’s Finding In IPR1713/1716/1733 That Particular Protrusion Heights Would Have Been Obvious

Apple fails to identify substantial evidence supporting the Board’s decisions that Masimo’s specific claimed protrusion height ranges would have been obvious. Resp. 47-49. Apple does not dispute that none of the Board’s combined references disclose specific protrusion heights. *Id.* 47. Apple points to the Board’s finding that Masimo’s expert purportedly did “not dispute [Apple’s expert’s] position that there were a finite number of options available for the height of the convex surface.” *Id.* (citing Appx00056). But Masimo’s expert never conceded that. Instead, Masimo’s expert explained that there was not a finite number of options because the references did not (1) teach or suggest the claimed range; (2) provide any basis for selecting any particular protrusion height; or (3) indicate that the claimed range would be comfortable. *See, e.g.*, Appx05347-05351; Appx12954-12958; Appx18903-18906.

Apple’s expert relied on Ohsaki, but testified he did not know Ohsaki’s protrusion’s shape. Br. 57-58 (collecting cites). Apple argues that its expert merely testified regarding Ohsaki’s protrusion’s shape, which “does not pertain to the particular protrusion *heights* that a POSITA would have found obvious.” Resp. 48 n.13. In reality, Apple’s expert acknowledged he did not know Ohsaki’s

protrusion’s shape or ***dimensions***. See, e.g., Appx05964-05965 130:13-131:16 (“there’s nothing that tells me anything in particular about the shape or ***dimensions*** of [Ohsaki’s] cover”); Appx05939-05940 105:1-106:5 (Ohsaki “doesn’t ever state dimensions, thicknesses, things like that”).

This is not a case where a reference merely fails to disclose “dimensions that exactly meet the limitation,” as in Apple’s cited precedent. Resp. 48 (citing *In re Warsaw Orthopedic, Inc.* 832 F.3d 1327, 1332 (Fed. Cir. 2016)). Ohsaki does not disclose ***any*** specific protrusion heights. It was the inventors who discovered specific heights provide an order of magnitude increase in signal strength. Appx00398 20:29-33.

Apple argues that there are a finite number of convex surface heights that “comfortably make[] intimate contact with human flesh.” Resp. 48. But neither Apple nor the Board identified any purported “finite number” of protrusion heights. Br. 57. Moreover, the motivation for the Board’s combination was not comfort, but rather improved adhesion. Appx00035; Appx00129; Appx00208; Appx00285-00286. Even assuming a POSITA would have employed Ohsaki’s convex surface to improve adhesion in Aizawa’s sensor (and a POSITA would not have done so for all the reasons above), there is no evidence the claimed height ranges would have provided increased adhesion. This is not a matter of “geometric precision,” as Apple

argues. Resp. 47. No reference explains why a POSITA would have used the claimed ranges to improve adhesion.

Apple cites *Uber Technologies, Inc. v. X One, Inc.*, 957 F.3d 1334, 1340 (Fed. Cir. 2020), Resp. 47, but *Uber* addressed a problem in which there were “*only two* identified, predictable solutions” existing in the art and thus substituting one option for the other was a predictable variation. *Uber Techs.*, 957 F.3d at 1340. In contrast, here, there is no evidence of a limited number of predictable solutions for a protrusion height that would (1) increase adhesion and (2) fall within the claimed ranges. Br. 57-58.

III. CONCLUSION

The Court should reverse or at least remand the Board’s decisions.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

May 4, 2023

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CERTIFICATE OF COMPLIANCE

1. This brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a). This brief contains 5,003 words, excluding the parts of the brief exempt by Federal Rule of Appellate Procedure 32(f) and Federal Circuit Rule 32(b)(2).

2. This brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and the type style requirements of Federal Rule of Appellate Procedure 32(a)(6). This brief has been prepared in a proportionally spaced typeface using Microsoft Word in 14-point font Times New Roman.

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May 4, 2023

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